

DD Month YYYY

TECHNICAL MANUAL CONTRACT REQUIREMENTS

ANNEX TO EXHIBIT E

Sequence Number: NAVAIR TSD TMCR-*YY-##*

Weapon System: *Training System Nomenclature*

Device Designation: *X#XXX*



Prepared by
NAVAIR TSD, TMSS



Technical Manual requirements contained herein have been cleared for use by
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TECHNICAL MANUAL CONTRACT REQUIREMENTS

1.0 SCOPE.

1.1 INTENT.

This Technical Manual Contract Requirement (TMCR) has been prepared to fully describe the Statement of Work (SOW) criteria for the development and acquisition of an Extensible Markup Language (XML) based, Electronic Technical Manual (ETM) used in the operation and maintenance of Device *X#XXX, Training System Nomenclature*. The technical data being developed and acquired under this contract consists of *Operation and Maintenance (O&M) Manual or Systems Operation and Maintenance Manual (SOMM) or Systems Interface Manual (SIM)*, Maintenance Related Drawings, the Planned Maintenance System (PMS), Training System Support Document (TSSD), XML Products (e.g., Data Type Description (DTD), Style Sheet, Schema, Format Output Specification Index (FOSI), etc.), and the acquisition and integration of Commercial Off-the-Shelf (COTS) Manuals and associated supplements. The products to be provided include a Review Draft Copy (RDC) (i.e., 20% Draft, 40% Draft, and an 80% Draft) to be posted to a contractor maintained website, a 100% Draft, Preliminary ETM and Final ETM to be provided on Compact Disc – Read Only Memory (CD-ROM) and Hardcopy. Delivery of the products under this TMCR shall be considered incomplete if the deliverable XML Products, listed in section 5.0 of this document, that allow storage, viewing, printing and editing are not delivered.

2.0 APPLICABLE DOCUMENTS.

2.1 GOVERNMENT DOCUMENTS.

2.1.1 Specifications, Standards and Handbooks.

For purposes of clarity and conformability, this TMCR will use the following specifications, standards and handbooks to focus separately on each requirement. Only pertinent information pertaining to the specific technical documentation and then, only to the extent specified herein, will be cited in these references.

SPECIFICATIONS:

MIL-M-82376B	Manuals, Technical: Operation and Maintenance Instructions for Training Devices
MIL-M-85337A	Manuals, Technical: Quality Assurance Program Requirements for Training Devices
MIL-P-29005B	Publications, Planned Maintenance Systems, for Training Devices

PERFORMANCE SPECIFICATIONS/STANDARDS:

MIL-STD-3001-1(AS)	Preparation of Digital Technical Information for Multi-Output Presentation of Technical Manuals (Part 1 of 8)
MIL-PRF-29612B	Performance Specification – Training Data Products
MIL-PRF-28001	Performance Specification – Markup Requirements and Generic Style Specification for Exchange of Text and Its Presentation
MIL-STD-38784	Standard Practices for Manuals, Technical: General Style & Format Requirements

HANDBOOKS:

MIL-HDBK-511	Interactive Electronic Technical Manuals (IETMs), Interoperability of
MIL-HDBK-1221(3)	Evaluation of Commercial Off-the-Shelf (COTS) Manuals
MIL-HDBK-9660B	DOD – Produced CD-ROM Products

(Copies of Military Standards and Specifications may be viewed online at <http://assist.daps.dla.mil/quicksearch/>)

2.1.2 Other Government Documents.

The following Government documents and publications form a part of this document to the extent specified herein.

DEFENSE FEDERAL ACQUISITION REGULATIONS SUPPLEMENT (DFARS):

DFARS 252.227-7013 Rights in Technical Data – Noncommercial Items (NOV 1995)
DFARS 252.227-7015 Technical Data – Commercial Items (NOV 1995)
DFARS 252.246-7001 Warranty of Data (DEC 1991)

(Copies of DFARS may be viewed online at <http://www.acq.osd.mil/dpap/dfars/index.htm>)

2.2 NON-GOVERNMENT PUBLICATIONS.

The following industry standards form a part of this document to the extent specified herein.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME):

USAS Y14.15-1966 Electrical and Electronic Diagrams
ANSI Y14.15a-1971 Interconnection Diagrams
ASME Y14.24-1999 Types and Applications of Engineering Drawings
ASME Y14.34M-1996 Associated Lists
ASME Y14.38-1999 Abbreviations and Acronyms
ASME Y14.100-2000 Engineering Drawing Practices
USAS Y32.16-1968 Reference Designations for Electrical and Electronics Parts and Equipments
ANSI Y32.16a-1970 Supplement to Reference Designations for Electrical and Electronics Parts and Equipments

(Application for copies of cited industry standards should be addressed to the American Society of Mechanical Engineers, 22 Law Drive, P.O. Box 2900, Fairfield, NJ 07007-2900.)

2.3 ORDER OF PRECEDENCE.

In the event of a conflict between the text of this document and the references cited herein, the text of this document shall take precedence. Nothing in this document, however, shall supercede applicable laws and regulations unless a specific exemption has been obtained.

3.0 REQUIREMENTS.

3.1 PREPARATION OF ELECTRONIC TECHNICAL MANUALS.

3.1.1 MIL-STD-38784.

MIL-STD-38784, paragraph 6.2 shall be used as follows. Relevant changes herein shall be deemed exceptions.

- am. The following distribution statement shall be placed on the cover and title page in accordance with (IAW) DoD Directive 5230.24, dated March 18, 1987:

Distribution Statement B Distribution authorized to U.S. Government Agencies only; administrative and operation use; *(date of determination)*. Other requests for this document shall be referred to:

Commanding Officer
Naval Air Systems Command, Training Systems Division, TMSS
12350 Research Parkway, Orlando, FL 32826-3275

- ao. The following authority notice shall be placed on the cover and title page:

Published under the authority of the Commanding Officer, Naval Air Systems Command,
Training Systems Division.

- bp. Supplements shall be prepared in accordance with (IAW) paragraph 3.2.3 of this TMCR.

3.1.2 Clarification of General Requirements.

3.1.2.1 ELECTRONIC TECHNICAL MANUALS (ETMS).

The Technical Data being developed under this TMCR shall accurately describe, depict and represent the accepted baseline configuration of the training device and support the Government's approved maintenance concept of the training device.

3.1.2.2 COVERAGE.

The contractor shall provide operation and maintenance data for all hardware and hardware interfaces, including those developed by subcontractors or vendors. The technical content shall as a minimum provide the detail of information contained in MIL-M-82376B, to include the following:

- a. Installation instructions
- b. Operation
- c. Theory of Operation
- d. Preventative Maintenance
- e. Testing and Troubleshooting (Corrective Maintenance)
- f. Parts Catalog
- g. Maintenance Related Drawings and Drawing Tree

3.1.2.3 AIRCRAFT COMMON OPERATING EQUIPMENT (ACOE).

The contractor shall provide and ensure that references to actual ACOE maintenance and operation manuals are accurate and up to date. ACOE is defined as unmodified equipment that is certified for use in operational fleet commands.

3.1.2.4 TRAINER UNIQUE EQUIPMENT.

The contractor shall provide documentation for all Trainer Peculiar Equipment (TPE) that will permit maintenance to be performed to the Intermediate and Depot (piece part) level of repair. TPE is defined as that which is modified or developed specifically for the training device and is not commercially available off-the-shelf. Contractor modified COTS and ACOE shall be considered TPE.

3.1.2.5 CLASSIFIED INFORMATION.

If classified information is required in the TMs, it shall be provided as a classified supplement to the basic document. (See paragraph 3.2.3 of this TMCR.) The basic document shall remain unclassified. Security requirements, downgrading instructions and security classification of classified supplements shall be in accordance with (IAW) MIL-STD-38784. No classified information or documentation shall be posted via the contractor maintained web site. References to appropriate documentation covering the handling of classified materials shall be placed in the text anytime contact with classified materials is possible during a procedure. References shall be in bold text.

3.1.2.6 SUBCONTRACTING.

If the development of the ETM under this task is subcontracted, the prime contractor shall ensure that all applicable ETM requirements contained in the basic contract are levied on all subcontractors. The prime contractor shall be ultimately responsible for delivery schedules and ensuring completion of quality assurance functions such as validation and in-process reviews (IPRs).

3.1.2.7 STANDARDIZED TERMINOLOGY.

In order to enhance Government/contractor communication, the following terminology and definitions shall be the standard and shall apply to all ETMs.

- a. Review Draft Copy (RDC) – Refers to the documentation in its developmental stage, prior to the contractor's preliminary submission (i.e., book plan/outline (20%), 40%, 80%, and 100%). The RDC shall be available to all Integrated Project Team (IPT) members through a contractor provided web site for the 20 % - 80% Draft and shall be available during the Physical Configuration Audit (PCA) for the 100% Draft. The RDC will be used to evaluate the contractor's progress; review for technical accuracy and adequacy and to assess compliance with contractually cited specifications and this TMCR.
- b. Preliminary ETM – Refers to the preliminary submission of the document in its entirety by the contractor. The Preliminary ETM is intended for use during verification and for training purposes at the device site(s) pending receipt of the final reproducible copy and distribution of the final manuals. Preliminary ETMs shall be complete and validated prior to delivery.
- c. Final ETM – Refers to the final submission of the documentation by the contractor. The Final ETM is the final document acceptable for reproduction and publication as an authenticated ETM. All necessary changes resulting from hardware testing and ETM verification shall be incorporated in the Final ETM.

3.1.2.8 ETM IDENTIFICATION.

The ETM shall be identified with a Government Publication Number. This number shall be displayed on the Title Page and at all times in the header of the ETM. This number shall also be display on the CD-ROM Sleeve Jacket and CD-ROM Label IAW Government provided template. The contractor shall request publication numbers from NAVAIR TSD TMSS.

3.1.2.9 DEFENSE FEDERAL ACQUISITION REGULATION SUPPLEMENT (DFARS).

DFARS 252.227-7013 and DFARS 252.227-7015 copyright license requirements and DFARS 252.246-7001 warranty of data requirements shall apply to the *O&M manual* *or* *SOMM* *or* *SIM*, PMS and COTS manuals. Statements "a." through "d." are applicable to all deliverables under this TMCR.

- a. Copyrights/Rights in Data. The contract to which this TMCR pertains includes data rights clauses that grant to the Government license rights in COTS manuals, manuals written to military specifications specifically for the Government and supplemental data to these manuals including manuals obtained from subcontractors and vendors.
- b. The contractor acknowledges and agrees that the Government, as a minimum is granted or permitted royalty-free, worldwide, non-exclusive, irrevocable license rights to use, modify, reproduce, perform, display, release, digitize or disclose the data delivered under the contract, in whole or in part, for Government purposes and to have or permit others to do so.
- c. The contractor shall apply the following statement so as for it to appear prominently on the data, "This material may be reproduced by or for the U.S. Government." By delivering the data, the contractor authorizes the NAVAIR TSD Contracting Officer, on the contractor's

behalf, to apply the statement if the data is delivered without it, and indemnifies the NAVAIR TSD Contracting Officer and the Government for so doing.

- d. Warranty of Data. The contract to which this TMCR pertains includes data warranty clauses that grant to the Government warranty for the accuracy of data in COTS manuals, manuals written to military specifications specifically for the Government and supplemental data to these manuals including manuals obtained from subcontractors and vendors. The period of warranty for all data shall be for three years after contract closeout. Government acceptance of contracted data does not terminate this warranty.

3.1.2.10 GOVERNMENT FURNISHED INFORMATION (GFI).

The contractor shall evaluate existing technical manuals and other draft material for adequacy. The contractor shall determine whether ETMs require format changes to meet the requirements of this task and formally request deviations to streamline ETM development and minimize cost and schedule impact. GFI is source data only and is not considered error free.

3.1.2.11 USE OF INDUSTRIAL STANDARDS.

Only nationally recognized industrial standards adopted by the Department of Defense (DoD) and addressed in this TMCR shall be used in the development of the technical data being procured under this TMCR. Contractor developed standards shall not be used without the expressed written consent of the NAVAIR TSD TMSS and NAVAIR TSD PCO.

3.1.3 Clarification of ETM Specific Requirements.

The requirements cited in this section are applicable to all deliverables under this TMCR.

3.1.3.1 VIEWING.

The ETM shall be downloadable and viewable using a standard commercial Internet browser (i.e., Microsoft Internet Explorer version 6.0 or higher, or Netscape) and will provide an error message when a hyperlink is unavailable.

3.1.3.2 FRAME-BASED AND SCROLLABLE.

Each separate section within the ETM shall be its own separate loadable page. Each page shall be scrollable within the page.

3.1.3.3 HYPERTEXT LINKING.

All references within the ETMs, including the Table of Contents and Index, and the PMS documentation shall be hypertext linked to the referenced procedure/drawing. For links to indexed PDF files, the link shall be to the specific paragraph/sheet; for non-indexed PDF files, the link shall be to the applicable document and the reference shall give specific paragraph/sheet information.

3.1.3.4 WARNING, CAUTION, NOTE, AND HAZARD SYMBOLS/ICONS.

Only the symbols and icons authorized by the MIL-STD-3001-1 paragraph C.5.5.5.1 through paragraph C.5.5.5.3 and paragraph C.5.5.8 shall be utilized within the ETM.

3.2 OPERATION AND MAINTENANCE (O&M) MANUAL REQUIREMENTS.

or

SYSTEMS OPERATION AND MAINTENANCE MANUAL (SOMM).

or

SYSTEMS INTERFACE MANUAL (SIM).

3.2.1 Clarification of O&M Manual Format.

The O&M manual shall be formatted IAW MIL-M-82376B, paragraph 3.3.1 and subsequent. Relevant changes herein shall be deemed exceptions.

or

Clarification of SOMM Format.

The SOMM shall be formatted IAW MIL-M-82376B, paragraph 3.3.2 and subsequent. Relevant changes herein shall be deemed exceptions.

or

Clarification of SIM Format.

The SIM shall be formatted IAW MIL-M-82376B, paragraph 3.3.3 and subsequent. Relevant changes herein shall be deemed exceptions.

3.2.1.1 MIL-M-82376B.

The following data shall be provided in the **O&M manual or SOMM or SIM** consistent with MIL-M-82376B, paragraph 6.2. Relevant changes herein shall be deemed exceptions.

- b. Unpacking and packing instructions for shipment are required.
- c. Installation information is required.
- g. Maintenance Requirement Cards (MRC) are required as a part of this procurement.
- k. DODISS issue dated **Month DD, yyyy** shall be used for this procurement.

(Copies of DODISS may be viewed online at <http://dodssp.daps.dla.mil/dodiss.htm>)

3.2.1.2 FRONT MATTER.

The Front Matter shall be prepared IAW MIL-M-82376B, paragraph 3.3.1.1.

3.2.1.3 PARTS CATALOG

The contractor shall utilize the provisioning database in the development of a Parts Catalog. The Parts Catalog shall fully reflect the Government's maintenance concept for the training device to the Lowest Repairable Unit (LRU) for each piece of equipment on the training device. The Parts Catalog shall be a single Microsoft® Excel® 2000 Workbook with three (3) sheets. Sheet 1 shall be the Parts Catalog sorted by Reference Designator. Sheet 2 shall be the Parts Catalog sorted by Reference Number (Part Number). Sheet 3 shall be the Parts Catalog sorted by Drawing Number, then by Find Number. The Parts Catalog shall contain the following data fields as defined by MIL-PRF-49506:

MIL-PRF-49506	MIL-PRF-49506
Code Assignment	Item Definition
0140	Commercial And Government Entity (CAGE) code
0280	Essentiality Code
0480	Item Name (i.e., Nomenclature)
0680	National Stock Number (NSN) and Related Data
0930	Quantity Per Assembly (QPA)
1030	Reference Designation
1050	Reference Number (i.e., Part Number)

1470 Unit of Issue

In addition, the Parts Catalog shall contain the following amplifying data fields defined as follows:

Data Field Name	Data Field Definition
Drawing Number	The Drawing Number on which the part is shown
Find Number	The Find Number for the Drawing identified above that indicates the Part
Original Equipment Manufacturer (OEM) CAGE code	This field shall be utilized any time the device components have been modified/alterd and/or assigned contractor CAGE codes.
OEM Reference Number	This field shall be utilized any time the device components have been modified/alterd and/or assigned contractor reference numbers.

The Parts Catalog shall include repairable assemblies for all Commercial Off-the-Shelf (COTS) and Non-Developmental Item (NDI) equipment and piece part level for all TPE. Piece part shall be defined as that level, which would allow the Government to openly compete requests for replacement spares that fit the Form, Fit and Function of the original TPE. The Parts Catalog shall be formatted to print on 11" x 17" paper and shall be included as a separately bound volume of the **O&M manual or SOMM or SIM**. NAVAIR TSD TMSS will provide a sample Parts Catalog upon written contractor request.

3.2.1.3.1 Original Equipment Manufacturer (OEM) CAGE and Part Number.

The contractor shall be responsible for providing the OEM CAGE and part number for device components that have been modified/alterd and assigned contractor part numbers. The parts catalog shall include both numbers.

3.2.1.4 PROGRAMMED INTEGRATED CIRCUITS.

Source code listings for firmware (i.e., the software stored in programmable Integrated Circuits (IC), e.g., PROMS, EPROMS, EEPROMS, etc.) shall be provided on CD-ROM, clearly identifiable to a specific IC. Non-modified COTS items shall be deemed exempt.

3.2.1.5 JUMPER LOCATION AND SWITCH SETTINGS.

Jumper location and switch settings that are required for proper timing, strobe signals and configuration (where applicable) shall be provided for all TPE and COTS circuit cards.

3.2.1.6 BUILT-IN-TEST-EQUIPMENT (BITE).

Specific instructions for use of BITE and maintenance diagnostics shall be provided.

3.2.1.7 MAINTENANCE RELATED DRAWINGS.

The following industrial standards shall be used in their entirety in the development of the maintenance related drawings and associated diagrams/lists: USAS Y14.15-1966, ANSI Y14.15a-1971, ASME Y14.24-1999, AMSE Y14.34M-1996, ASME Y14.38-1999, ASME Y14.100-2000, USAS Y32.16-1968, ANSI Y32.16A-1970. Relevant changes herein shall be deemed exceptions. Maintenance related drawings shall be developed for reproduction on 11" x 17" paper and be provided as a separately bound volume of the **O&M manual or SOMM or SIM** with an introductory paragraph and a Data List located in maintenance drawing section of the corresponding **O&M manual or SOMM or SIM**. The Data List shall consist of three tables, the first shall list the drawings in the order in which they appear in the Drawing Volume, the second shall list the drawings in numeric sequence by drawing number to title, the third shall list the drawings in alphanumeric sequence by title to drawing number.

3.2.1.7.1 System Family Tree.

The first drawing in the Drawings Volume shall be the System Family Tree. The Family Tree shall be presented graphically utilizing drawing information blocks (as opposed to a listing). Contractor format for the Family Tree is authorized with Government approval of the format. The format shall be presented at the first In-Process Review for Government review and approval.

1. The first sheet(s) of the Family Tree shall depict the layout of the training device, and will include the facility structure, facility-to-trainer main power and all entrances/exits. Major units of the system shall be numbered (using assigned reference designations) and identified in an accompanying table.
2. Subsequent sheets of the Family Tree shall present, in top-down-breakdown order, the entire training device system. ALL drawings pertaining to the training device shall be included in the Family Tree. A legend shall be provided to aid in interpreting each drawing information block. At a minimum, each drawing information block shall include: the drawing title, revision level, reference designation, date released, type drawing, whether GFE, whether a purchased part, refurbished or TPE.

3.2.1.7.2 Linking of Maintenance Related Drawings.

All drawings from the Product Drawings and Associated Lists (PDAL) that are referenced within the text of the O&M manual or SOMM or SIM shall be converted into indexed Adobe® portable document files (*.pdf) format and shall be hypertext linked from the O&M manual or SOMM or SIM.

3.2.1.8 MODIFIED ACOE AND COMMERCIAL OFF-THE-SHELF (COTS) EQUIPMENT.

For modified ACOE and COTS equipment, the contractor shall provide an altered item diagrams package IAW ASME Y14.24-1999 and ASME Y14.100-2000. These diagrams shall completely document the change and be included in the maintenance related drawings of the O&M manual or SOMM or SIM. The diagram package shall consist of new and revised diagrams such as schematics, assembly diagrams, mechanical diagrams and source and specification control diagrams. Changes to existing documentation such as parts listings, illustrations and theory of operation from the modification shall also be included in the O&M manual or SOMM or SIM text.

3.2.1.9 TRAINER FACILITIES REPORT.

The final, Government accepted, Trainer Facilities Report shall be included as the first Appendix to the first volume of the O&M manual or SOMM or SIM. The Trainer Facility Report shall be formatted IAW the SOW and the appropriate Contract Deliverable Requirements List (CDRL).

or

SITE PREPARATION REQUIREMENTS AND INSTALLATION PLAN.

The final, Government accepted, Site Preparation Requirements and Installation Plan shall be included as the first Appendix to the first volume of the O&M manual or SOMM or SIM. The Site Preparation Requirements and Installation Plan shall be formatted IAW the SOW and the appropriate Contract Deliverable Requirements List (CDRL).

or

TRAINER FACILITIES DATA.

The contractor shall prepare as the first appendix to the first volume of the O&M manual or SOMM or SIM, Trainer Facilities Data. The Trainer Facilities Data shall provide the following data:

- a. Text detailing the Military Installation, to include building number and room number where the equipment is installed;
- b. A figure of the detailed Floor Plan;

- c. Text detailing the minimum widths and heights of access openings;
- d. A figure detailing the minimum clear space requirements for operation and maintenance;
- e. A table listing equipment descriptions, quantities, dimension and weight;
- f. Text detailing the requirements for Facility Fire Suppression;
- g. A table with a figure detailing the requirements for Raised Flooring, Trenches, or Wall Openings, to include dimensions and locations;
- h. A figure detailing critical dimensions and locations for Special Foundations and Pads;
- i. A table detailing Static and Dynamic loads and moments placed on the facility structure;
- j. A table detailing Temperature and Humidity tolerances for the equipment;
- k. A table detailing Heating, Ventilation, and Air Conditioning (HVAC) requirements, to include heat loads in BTU per hour or KW for each room;
- l. Text with figure detailing Facility Plumbing, if required;
- m. A table with figure detailing Facility Electrical requirements, to include power voltages, KVA loading of the equipment, details for the termination of the Government Furnished Disconnects, and details for Grounding the equipment; and,
- n. Text detailing Communications requirements.

3.2.1.10 GLOSSARY.

The contractor shall provide a glossary of acronyms, mnemonics and abbreviations.

3.2.1.11 INDEX.

An index shall be required for ETMs that exceed 100 paragraphs. The index shall be prepared IAW MIL-STD-38784, paragraph 4.2.9.8. Keywords shall include, but are not limited to, system and subsystem nomenclatures, operating and maintenance procedures, trainer peculiar equipment and other significant nomenclature.

3.2.2 Clarification of COTS Documentation and Associated Supplements.

3.2.2.1 COTS DOCUMENTATION REQUIREMENTS.

The contractor shall be responsible for providing all COTS documentation necessary to meet the Government maintenance concept. The contractor shall be responsible for assuring that all COTS documentation conforms to contract requirements. All COTS documentation shall be written in Standard American English (SAE). MIL-HDBK-1221(3) may be used as guidance concerning achieving COTS documentation criteria. Unpacking and repacking instructions for shipment are required. The COTS documentation shall contain as a minimum:

- a. Theory of Operation
- b. Operating Instructions
- c. Troubleshooting Procedures
- d. Schematics
- e. Parts Listings

3.2.2.2 COTS DOCUMENTATION INTEGRATION.

The COTS documentation shall be obtained in electronic media or scanned into indexed electronic media (i.e., portable document format) for inclusion on the ETM CD-ROM. Procedures referenced out from the main text of the ETM to a COTS document shall be hypertext linked, where possible, to the specific paragraph within the COTS document. Where hypertext linking to the specific paragraph is not possible, the hypertext link shall direct the viewer to the proper COTS document and exact page and paragraph references will be made in the main text of the ETM.

3.2.2.3 CONTRACTOR RESPONSIBILITIES REGARDING COTS DOCUMENTATION.

The contractor shall review the documentation and correct deficiencies or deviations in the manuals prior to submission of the ETM. If the COTS document fails to meet the criteria set forth in paragraph 3.2.2.1 of this TMCR

and the contractor is unable to retrieve the required data from the vendor, the contractor shall develop supplementary data for inclusion in the main text of the ETM ensuring that all required data for the COTS item is presented.

3.2.2.4 COTS / SYSTEM INTERFACING.

The contractor shall be responsible for developing and/or providing documentation that depicts the interface of the COTS item with the training device. This documentation will be incorporated into all of the maintenance data and shall be complete to the degree that would allow maintenance to the level of repair dictated by the maintenance concept of the training device.

3.2.2.5 PROPRIETARY DOCUMENTATION.

The contractor shall inquire of each potential subcontractor and vendor as to the availability of documentation that would allow maintenance to the level of repair dictated by the maintenance concept of the training device. Inability to provide this documentation or declaring this data to be proprietary, and, as such, not available to the Government, shall constitute in the disqualification of the use of their equipment in the training device.

3.2.2.6 APPLICABILITY OF COTS EQUIPMENT.

Each individual COTS document shall identify, describe and be directly applicable to the delivered configuration of that specific COTS equipment by serial number and model number(s) with applicable revision identifiers.

3.2.2.7 AUTOMATIC DISTRIBUTION OF VENDOR DATA.

The contractor shall be responsible for arranging with all vendors of COTS equipment to place NAVAIR TSD, TMSS, on automatic distribution for all vendor data (furnished at no cost to the Government) for a period of 36 months, including but not limited to, manufacturer's product improvement bulletins, modification instructions, documentation changes, or errata sheets related to procured equipment.

3.2.2.8 COTS DOCUMENTATION LICENSING DISCLOSURE.

Included on the ETM CD-ROM shall be a text file named "COTS Licensing.txt." This file shall begin with the following statement:

The Commercial Off-the-Shelf (COTS) documentation contained on this disc was procured under contract of the U.S. Government and as such is subject to the provisions of the clause at DFARS 252.227-7015. This material may be reproduced by or for the U.S. Government pursuant to the copyright license under the clause at DFARS 252.227-7015.

3.2.2.9 COTS DOCUMENTATION LISTING.

Included on the ETM CD-ROM shall be an MS Excel spreadsheet listing all COTS documentation provided on the disc with hypertext links to the appropriate document. This list shall include the title of the COTS document and the manufacturer, part number, model number and version of the COTS item.

3.2.2.10 AVAILABILITY OF THE COTS DOCUMENTATION.

The vendor shall ensure that all COTS documents are made available for review and inventory at the 80% Technical Manual review. All COTS documentation to support those items on the Interim Support Items List (ISIL) is to be provided to all validation of the items to be spared.

3.2.3 Clarification of Supplements.

A supplement shall be used in conjunction with a basic manual to:

- a. Isolate classified information.
- b. Expedite delivery of additional information.

- c. Augment the content of existing manual(s) to extend coverage to another equipment or maintenance level.

3.2.3.1 SUPPLEMENT RESTRICTIONS.

Supplements shall not be used to provide corrections to a basic manual, which were brought about by a change to the hardware or system.

3.2.3.2 SUPPLEMENT SPECIFICATION REQUIREMENTS.

Supplements shall conform to the requirements of the specifications used to prepare the basic manual.

3.2.3.3 SUPPLEMENT PUBLICATION NUMBERS.

Supplements shall assume the publication number assigned to the basic manual followed by the appropriate supplement number, i.e., P-1234-S1, -S2, etc.

3.3 PLANNED MAINTENANCE SYSTEM (PMS).

3.3.1 Clarification of PMS Documentation.

3.3.1.1 GENERAL REQUIREMENTS AND SCOPE.

The Planned Maintenance System (PMS) documentation developed under this TMCR shall be consistent with the guidance contained in MIL-P-29005B, paragraph 3.1 and paragraph 3.1.1.

3.3.1.2 MAINTENANCE REQUIREMENT CARDS (MRC).

Maintenance Requirement Cards (MRCs) shall be required as a part of this effort. MRCs shall be prepared IAW MIL-P-29005B, paragraphs 3.2.1 through paragraph 3.2.1.10.2. MIL-P-29005B, Figures 1 through Figure 25 may be used as guidance for format and style of MRCs.

3.3.1.3 SEQUENCE CONTROL CHART (SCC).

A Sequence Control Chart (SCC) shall be required as a part of this effort. The SCC shall be prepared IAW MIL-P-29005B, paragraphs 3.2.2 through paragraph 3.2.2.2. The SCC shall be capable of being printed on size B through size D paper without the loss of resolution or legibility. MIL-P-29005B, Figure 26 may be used as guidance for format and style of the SCC.

3.3.1.4 LINKING OF MAINTENANCE REQUIREMENT CARDS.

All MRCs shall be hypertext linked from the SCC and to any referenced procedures.

3.4 TRAINING SUPPORT DOCUMENTATION.

3.4.1 Clarification of Training System Support Document (TSSD).

3.4.1.1 TSSD CONTENT.

The content and processes contained within the TSSD shall be developed IAW the CDRL.

3.4.1.2 TSSD DATA FORMAT.

The format of the TSSD data shall be consistent with the requirements of this TMCR to facilitate use of the XML Products (e.g., DTD, Style Sheet, Schema, FOSI, etc.) as developed under this TMCR.

4.0 QUALITY ASSURANCE.

4.1 QUALITY ASSURANCE DOCUMENTATION.

4.1.1 MIL-M-85337A.

MIL-M-85337A shall be used in its entirety. Contractor support at verification is required and shall include, but is not limited to, the following:

- a. Provide assistance in the development of a verification plan and schedule, when requested.
- b. Record and maintain records of TM changes required as a result of, or associated with, the verification process.
- c. Provide assistance in performing verification tasks, as required.
- d. Make the necessary corrections to discrepancies revealed during verification.

4.1.2 MIL-PRF-29612B.

The content of the TSSD shall be validated and verifiable as outlined in MIL-PRF-29612B, paragraphs 4.3.11 through 4.3.11.1.

4.2 CLARIFICATION OF QUALITY ASSURANCE.

4.2.1 Scheduled In-Process Reviews (IPRs).

4.2.1.1 SCHEDULING IN-PROCESS REVIEWS (IPR)

The Government may conduct IPRs, such as 20% and 40%, via on-site visitation or desktop as deemed feasible. 80% and 100% IPRs shall be conducted at site with availability to the device. The government has final approval authority of the frequency of IPRs. The following are milestones that the Government expects the contractor's compliance during the aforementioned IPRs.

- a. 20% Complete:
 1. An Outline or Bookplan shall be completed for the O&M Manual or SOMM or SIM and TSSD.
 2. Working draft of expected Planned Maintenance procedures shall be available.
 3. Working listing of COTS manuals shall be available.
- b. 40% Complete:
 1. Text development well underway for O&M Manual or SOMM or SIM and TSSD.
 2. MRC cards identified.
 3. Draft Sequence Control Chart (SCC) shall be complete.
 4. COTS manuals shall be identified and a listing shall be provided. Any COTS manuals already acquired shall be available for review.
 5. Maintenance related drawings shall be in development.
 6. Anticipated date of this review shall be listed in the Integrated Master Schedule.
- c. 80% Complete:
 1. Preliminary MRC cards shall be available.
 2. COTS manuals meeting the standards outlined in MIL-HDBK-1221(3) and this TMCR shall be FRC.
 3. O&M Manual or SOMM or SIM and TSSD text shall be complete.
 4. Anticipated date for this review shall be listed in the Integrated Master Schedule.
- d. 100% Complete, Physical Configuration Audit (PCA):
 1. O&M Manual or SOMM or SIM, COTS manuals and associated supplemental data, PMS documentation, and TSSD meeting the standards outlined in this TMCR shall be ready for Preliminary submittal.

2. Anticipated date for this review shall be listed in the Integrated Master Schedule.

4.2.1.2 DOCUMENTATION REVIEW METHOD.

Each contractor developed deliverable shall be at the percentage of completion designated in the contract for that specific IPR. The contractor shall make available three (3) hardcopies and one (1) softcopy of all documentation. Hardcopies shall be provided in the same format that is required for the Preliminary ETM/Final ETM as prescribed in paragraph 5.2 of this TMCR.

4.2.1.3 VALIDATION AND VERIFICATION.

4.2.1.3.1 Procedures Subject to Validation.

All operation and maintenance procedures, including but not limited to operation, checkout, troubleshooting, calibration, alignment, disassembly and re-assembly instructions for scheduled and unscheduled removal and replacement shall be validated by actual performance on the related hardware. The contractor personnel performing these procedures shall use only the ETMs being validated. No shortcuts, engineering notes or corporate knowledge developed in training or through experience shall be used during the validation.

4.2.1.3.2 Referenced Procedures.

Procedures contained in COTS manuals that are referenced from the **O&M Manual** *or* **SOMM** *or* **SIM** and PMS documentation shall be validated in their entirety. Referencing out to a COTS manual shall be done only with the written consent of the Government.

4.2.1.3.3 Identical Procedures.

Identical procedures resident in more than one manual are validated once. The contractor's validation records shall indicate the procedures that are duplicated.

4.2.1.3.4 Single Point of Contact.

The contractor shall designate a single point of contact that shall be responsible for providing the NAVAIR TSD TMSS with the validation schedules and other information pertinent to the NAVAIR TSD TMSS' participation in the validation process. The contractor shall provide the NAVAIR TSD TMSS with an advance notice of at least ten (10) full working days prior to scheduling a validation effort.

4.2.1.3.5 ETM Acceptability.

The contractor's validation and the Government's verification shall satisfy ETM acceptability. Failure of the contractor to validate the ETMs will result in rejection of the preliminary ETMs. The ETMs will remain in a rejection status until they are validated and witnessed.

4.2.1.3.6 Timeliness of Validation.

Validation of operation and maintenance procedures in the preliminary ETMs shall be accomplished in time to incorporate changes resulting from validation prior to the scheduled start of verification. Procedures that cannot be validated by the scheduled start of verification due to a lack of time, defective or reconfigured hardware, lack of support equipment, etc., shall be validated as soon as the constraint is removed but prior to verification. The Government shall approve validation on an ETM-by-ETM basis. Concurrent validation and verification shall not be done without the expressed written consent of the Government.

4.2.1.3.7 Validation Records.

The contractor shall maintain records of validation. The records shall be made available from the contractor maintained web site. Originals shall be made available for Government review during IPRs. Contractor format of the Validation Record shall be acceptable.

5.0 DELIVERY REQUIREMENTS.

5.1 ELECTRONIC MEDIA DELIVERY REQUIREMENTS.

5.1.1 General Requirements.

All CD-ROMs shall be clearly labeled IAW the Government provided Template. Portable document format (PDF) files shall be optimized in the final save process. Files delivered to the Government shall not be password protected, nor delivered in proprietary format. When vector graphics in CGM (Computer Graphic Metafile) or SVG (Scaleable Vector Graphic) format are delivered as a final product, the graphic source file used to produce these vector graphic format files shall also be delivered.

5.1.2 Content Files.

The ETM CD-ROM shall contain a README.TXT file containing instructions for opening, viewing and printing the ETMs, as guided by MIL-HDBK-9660B. The ETM CD-ROM shall contain an INDEX.TXT file containing the following data in tabular form from left to right:

- a. Publication Identification Number
- b. Publication Date
- c. Publication Title
- d. Publication Revision Level
- e. File Name and Format

5.1.3 Deliverable XML Products.

Extensible Markup Language (XML) 1.0 (Third Edition) shall be used to deliver the products specified in this paragraph. These XML products allow for storage, viewing, printing and editing of the ETMs and shall be delivered as a part of this effort. The XML products for this effort include, but are not limited to, the following:

- a. XML Source Files (Ref. 5.1.3.1)
- b. Document Type Definition (Ref. 5.1.3.2)
- c. XML Schema (if used to prepare the ETM) (Ref. 5.1.3.3)
- d. XML Style Sheet (Ref. 5.1.3.4)
- e. Format Output Specification Index, FOSI (Ref. 5.1.3.5)
- f. DTD Data Dictionary (Ref. 5.1.3.6)
- g. Tagging Conventions Document (Ref. 5.1.3.7)
- h. Entity Files (Ref. 5.1.3.8)

5.1.3.1 XML SOURCE FILES.

The XML source files shall consist of the ETM text with the embedded XML tags. These are the information content files that will be stored and maintained in a repository or database at the document management activity.

5.1.3.2 DOCUMENT TYPE DEFINITION (DTD).

The purpose of a DTD is to define the structure and content of the XML document. It defines the document structure using a list of specific elements. The DTD, whether new or existing, shall be delivered as specified herein.

5.1.3.3 XML SCHEMA.

A schema is an XML construct used to describe data content. A schema may be used in place of a DTD. If a schema is used, it shall be delivered as specified herein.

5.1.3.4 XML STYLE SHEET.

An XML file contains no formatted information, so descriptions of formats, called style sheets, are used to determine which style or format to apply to an ETM written to a specific DTD. A DTD can have multiple style

sheets called Cascading Style Sheets (CSS) associated with it to provide alternate formats for instances conforming to that DTD. For example, there is a style sheet for viewing (outputting) the ETM on a monitor, and another style sheet for outputting the ETM to a printer. A FOSI, described in paragraph 5.1.3.5 may be used instead of style sheets. Whichever tool is selected, CSS or FOSI, it shall be delivered as specified herein.

5.1.3.5 FORMAT OUTPUT SPECIFICATION INSTANCE (FOSI).

As an alternative to using style sheets, a Formatted Output Specification Instance (FOSI) produced IAW military specification MIL-PRF-28001, can be used, but the preferred delivery product for XML is the style sheet. Whichever tool is selected, CSS or FOSI, it shall be delivered as specified herein.

5.1.3.6 DTD DATA DICTIONARY.

The DTD Data Dictionary defines the meaning of the XML tags used with the DTD, and shall be delivered as specified herein.

5.1.3.7 TAGGING CONVENTIONS DOCUMENT.

The Tagging Conventions document describes the rules for applying each XML tag to actual data or document content. It is meant to be a practical guide to authors in applying the markup to real document content and to describe the preferred way to tag (markup) the document in accordance with the DTD. The Tagging Conventions document shall be delivered as specified herein.

5.1.3.8 ENTITY FILES.

All entity files that used in the creation of the ETM shall be delivered as specified herein. Entity files are files associated with the source file that may be created and referenced by the DTD. Some entity files are created when there is standard text in the document that will be used or shared among instances of a class of documents. Other entity files, such as those provided in the ISO character entity sets, are used to provide special characters (e.g., the degree symbol and mathematical symbols) in the ETM. The contents of these entity files are available to any document using the associated DTD.

5.1.4 Review Draft Copy (RDC).

The RDCs shall be posted to a contractor maintained website and available on CD-ROM by request. Text shall be in Adobe® Acrobat® 6.0 (*.PDF) indexed format. Maintenance related drawings shall be in AutoCAD® 2000 (*.DWG) format. Figures and line drawings shall be in Computer Graphics Metafile (CGM) or WebCGM format. The SCC for the PMS shall be in AutoCAD® 2000 (*.DWG) format.

5.1.5 Preliminary ETM.

The Preliminary ETM shall be delivered on CD-ROM. Text shall be in Adobe® Acrobat® 6.0 (*.PDF) indexed format with any CGM files already incorporated into the text. Maintenance related drawings shall be in AutoCAD® 2000 (*.DWG) format. The SCC for the PMS shall be in AutoCAD® 2000 (*.DWG) format.

5.1.6 Final ETM.

The FRCs shall be delivered on CD-ROM utilizing the same criteria for Preliminary ETMs with the following exceptions:

- a) NAVAIR TSD TMSS/TRNG/DRPR CD-ROMs shall contain:
 - 1) XML Sources Files
 - 2) XML Products
 - 3) Document in Adobe® Acrobat® 6.0 (*.PDF) indexed format with Maintenance Related Drawings in SVG, CGM or WebCGM format.

- 4) Folder containing all graphics (i.e., figures, digital pictures, drawings, and line art) in their native nonproprietary format.
 - 5) Folder containing all maintenance related drawings in AutoCAD® 2000 (*.DWG) format.
- b) All other addressees' CD-ROMs shall contain:
- 1) Document in Adobe® Acrobat® 6.0 (*.PDF) indexed format.
 - 2) Maintenance related drawings in SVG, CGM or WebCGM format.

5.2 HARDCOPY DELIVERY REQUIREMENTS.

The contractor shall deliver a hardcopy of the ETMs to the site for the Preliminary ETM and the Final ETM. Hardcopy documents shall be delivered in 3 ringer binders separated by volume IAW MIL-STD-38784, relevant changes herein shall be deemed exceptions. Binders shall not be larger than 2.5 inches. All volumes shall have printed indexing tabs separating each section.

6.0 ADMINISTRATIVE REQUIREMENTS.

6.1 CONTRACTOR RESPONSIBILITIES DURING GOVERNMENT REVIEW.

The contractor is responsible for completing the following actions throughout the Government review period:

- a. Correct data pertaining to errors or omissions that could cause a hazard to personnel or damage to the equipment shall be disseminated to NAVAIR TSD TMSS and to the device site(s) in the most expeditious means available immediately upon discovery. Delivery of errata pages containing corrected data, shall be mailed to all addressees listed on the DD Form 1423 item not more than fifteen (15) days after release of the message.
- b. Errata pages correcting errors or omissions that could cause downtime or improper operation of the training device shall be disseminated to all addressees listed on the DD Form 1423 item not more than thirty (30) days after discovery.

6.2 NOTIFICATION OF DELAYS IN DELIVERY.

In the event that the contractor cannot meet the delivery schedule of any ETM cited in this contract and or applicable order issued under this contract, NAVAIR TSD TMSS via NAVAIR TSD Contracting Officer shall be immediately notified of the delay by letter. The letter shall address the following.

- a. Item(s) being delayed,
- b. Reason for delay,
- c. Corrective action required,
- d. Proposed new delivery schedule, and
- e. Request for extension, if applicable.

Notification of delay in delivery does not constitute contractual compliance of such delivery requirement nor waive any contractual obligation.

6.3 RETENTION OF MATERIAL INSTRUCTIONS.

The contractor is authorized to retain the reproducible media in order to facilitate preparation of future changes or revisions to the ETM. This shall be accomplished subject to the following conditions:

- a. That no cost to the Government is incurred for storage or delivery upon request.
- b. In addition to furnishing all stored documentation with ample protection against humidity, spills and other types of physical damage, the contractor's storage facility shall satisfy the security requirements of any classified information in his custody.

- c. The contractor shall deliver the reproducible media to the Government upon request or 60 days after expiration of the contract, unless otherwise requested by the Government and agreed to by the contract.

Appendix A: NAVAIR TSD Style Sheet

REFERENCES

- DI-SESS-81527B; Data Item Description; Training System Support Document.
- DOD Directive Number 5230.24; Distribution Statements and Technical Documents.
- MIL-M-82376B; Manual, Technical: Operation and Maintenance Instructions for Training Devices.
- MIL-M-85337A; Manuals, Technical: Quality Assurance Program Requirements for Training Devices.
- MIL-P-29005B; Publications, Planned Maintenance Systems, for Training Devices.
- MIL-PRF-29612B; Performance Specifications, Training Data Products.
- MIL-STD-38784; DOD Standard Practice for Manuals, Technical: General Style and Format Requirements.

**ACRONYMS/
ABBREVIATION**

- Only industry/device (acceptable/traceable) acronyms/abbreviations and terms shall be used.
- The acronym or term is spelled out the first time it is used within each section, with the abbreviation in parentheses.
- Used in the paragraph heading when required.

BACK MATTER

- Appendices:
 - Appendix A Reference and Text Materials
- Naval Air Systems Command Training Systems Division Technical Publication Deficiency Report (TPDR) NAVAIR TSD 4790/66 (REV 11/2002)
- Back Cover.

BLANK PAGES

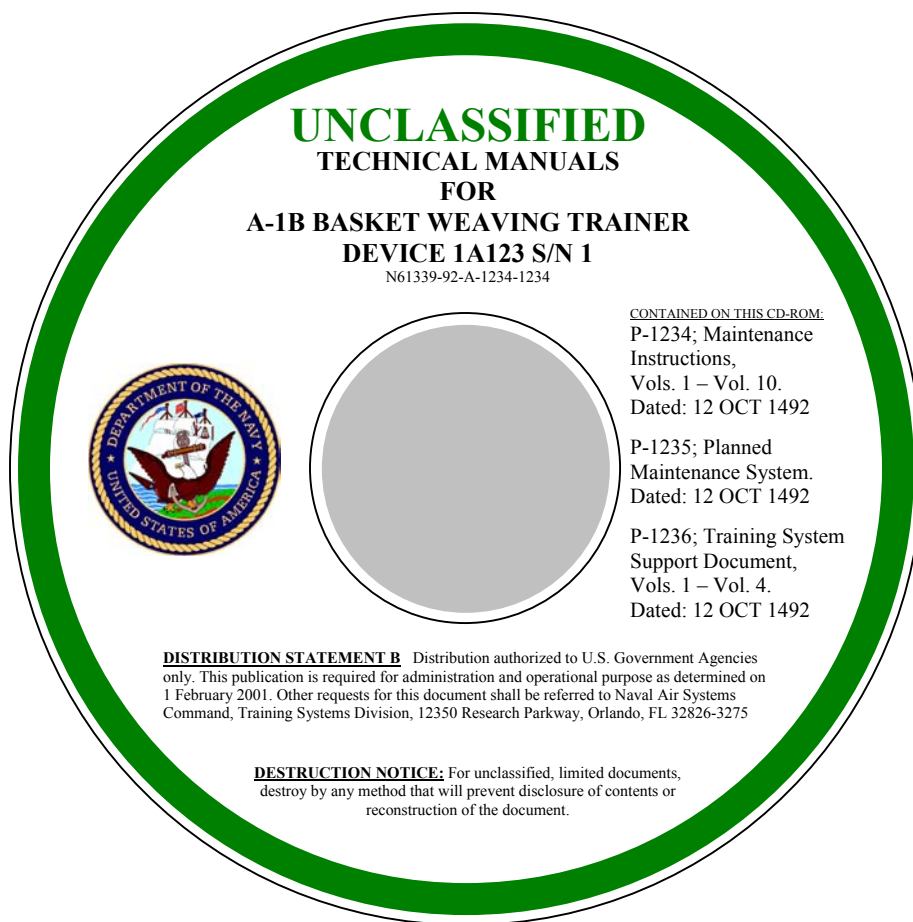
- When a blank page is used, the previous page will carry the page number in the following format: **I-1/(I-2 blank)**.
- (Section 1, page 1 followed by a slash, then Section 1 page 2.)

BULLETS

- Bullets are used with lists where appropriate.
- First level bullets are round.
 - Second level is indented, and bullets are square.
- Bullets shall not extend past the second level.

**CD LABEL AND
SLEEVE**

As per samples



SAMPLE

**TECHNICAL MANUALS CONTAINED ON THIS
COMPACT DISC (CD-ROM)**

1. P-1234: MAINTENANCE INSTRUCTIONS, A-1B BASKET WEAVING TRAINER, DEVICE 1A123 S/N 1; VOLUMES 1 THROUGH VOLUME 10
DATED: 12 OCTOBER 1492
2. P-1235: PLANNED MAINTENANCE SYSTEM, A-1B BASKET WEAVING TRAINER, DEVICE 1A123 S/N 1
DATED: 12 OCTOBER 1492
3. P-1236: TRAINING SYSTEM SUPPORT DOCUMENT, A-1B BASKET WEAVING TRAINER, DEVICE 1A123 S/N 1; VOLUMES 1 THROUGH VOLUME 4
DATED: 12 OCTOBER 1492

UNCLASSIFIED

UNCLASSIFIED

**TECHNICAL MANUALS
FOR
A-1B BASKET WEAVING TRAINER
DEVICE 1A123 S/N 1**

N61339-92-A-1234-1234



Distribution Statement B Distribution authorized to U.S. Government Agencies only. This publication is required for administration and operational purpose as determined on 12 October 1492. Other requests for this document shall be referred to Naval Air Systems Command, Training Systems Division, 12350 Research Parkway, Orlando, FL 32826-3275

DESTRUCTION NOTICE For unclassified, limited documents, destroy by any method that will prevent disclosure of contents or reconstruction of the document.

Published by Direction of the Commanding Officer
Naval Air Systems Command, Training Systems Division, Orlando Florida

12 OCTOBER 1492

SAMPLE

FIGURES

- Figures include all illustrations, such as diagrams, charts, screen shots, photographs and digital images.
- Figures shall be centered horizontally on the page.
- Figure captions are Arial 12 pt. **bold**, centered *below* the figure.
- Double space before the caption.
- Triple space after the caption.

Example:



Figure X-X. Figure Format Example

FONT

- Arial 16 pt. for first level Section Headings.
- Arial 14 pt for second level headings
- Arial 12pt. for normal body text

FRONT MATTER

- Cover and Title Page according to NAVAIR standards, following MIL-STD-38784.
- The Seal on the cover is 1.5 inches height.
- Front matter according to DID and MIL-PRF-29612B Appendix A, for TSSD.
- MIL-M-82376B for Operation and Maintenance Manual.
- MIL-P-29005B for Planned Maintenance System.

VOLUME NO. 1

UNCLASSIFIED
SAMPLE

TECHNICAL MANUAL
MAINTENANCE INSTRUCTIONS
ORGANIZATIONAL
GENERAL DEVICE INFORMATION
FOR
A-1B BASKET WEAVING TRAINER

DEVICE 1A123 SERIAL NO. 1

(VOLUME 1 OF 10)

N61339-92-A-1234-1234



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PREPARED BY: WIDGET MAKERS INC.
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Any City, AS 12345-6789

PREPARED FOR:



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Naval Air Systems Command, Training Systems Division, Orlando Florida

UNCLASSIFIED

12 OCTOBER 1492

GRAMMAR

Acceptable/traceable Grammar rules shall be used.

GRAPHICS

- No borders will be placed around screen captures or illustrations, etc.
- Graphics shall be labeled with figures caption.
- Logo on cover page is 1.5 inches in height.
- Digital photography – images produced with digital media shall be easily identifiable when reproduced using standard black & white Windows® compatible printer.

**GUI
TERMINOLOGY**

Industry acceptable (traceable standards) terminology shall be used to describe user interaction with the device.

**HEADERS AND
FOOTERS
(printed documents)**

- NAVAIR document (P) number in the top flush right outer edge of the header.
- A 1.5 pt. rule line divider is under the header content.
- Page numbers are placed in the bottom outer edge (footer) of each page.
- A 1.5 pt. rule line divider is over the footer content.
- Working drafts shall have file path and date of last modification in the footer, but will be removed for deliverables

**HEADINGS/
PARAGRAPH
NUMBERING**

Section headings

- New Section begin on a new page and are numbered with Roman numerals.
- Section headings/titles are 16 pt., all caps, bold, and centered.
- Double spaced below the section number is the section title in 16pt., all caps, bold, and centered. Each section title shall spell out the entire name with the acronym in parenthesis (if required).
- Triple space below the section title.
- Paragraph numbering uses the decimal numbering system.
- Single column format.
- Levels will not exceed the fifth level.
- The second level heading is 14pt all caps, boldface, and underlined. Double spacing precedes and follows the heading. Paragraph body is 12pt.
- Third through fifth level headings are title caps 12 pt, boldface, and underlined. A period follows the heading, then two spaces, then the body text (12pt) begins on the same line.

Heading Examples:

SECTION I

HEADING TITLE

1.1 SECOND-LEVEL HEADING.

All caps, bold, underlined, double space before and after, and paragraph text begins on the next line.

1.1.1 Third- Level Heading. Title case, bold, underlined, period follows heading, and paragraph text begins on the same line.

1.1.1.1 Forth-Level Heading. Title case, bold, underlined, period follows heading, and paragraph text begins on the same line.

1.1.1.1.1 Fifth-Level Heading. Title case, bold, underlined, period follows heading, and paragraph text begins on the same line.

LINE SPACING

- Electronic Technical Manual (ETM) is designed in single column format.
- Body line spacing in draft and preliminary documents is 1½.
- Body line spacing in final delivery is 1½ spaced.
- Second level paragraph headings are double spaced before and after.

**MARGINS
 (printed documents)**

Body of the text is left aligned.
 Upper – 1 inch
 Lower – 1 inch
 Left - 1.25 inch
 Right – 1 inch.

**NUMBERING,
 FIGURES AND
 TABLES**

- Figures and Table are numbered consecutively within each section.
- The numbers are all Arabic. The first number is the section number, followed by a dash, and then the consecutive number of the figure or table, and then a period and two spaces.
 (Example: the first figure in Section III is; Figure 3-1. Figure Title)
 (Example: the first Table in Section III is; Table 3-1. Table Title)

PAGE NUMBERING

- Front matter is paginated in lower case roman numerals. Front matter begins with the cover sheet, but it does not have the page number printed and is understood to be "i". The next page is "ii".
- Numbering is placed in the outer edge flush of the document, alternating sides of the pages.
- The body of the document is paginated with the section number in Roman numeral followed by a dash, and then the sequential Arabic page number of that section.
- Page numbers are bolded.
- Example for Section III, page 18: **III-18**
- If More than one Volume, Example; Volume I, Section III, Page 18: **1-III-18**.
- Appendices are paginated with the appendix number followed by a dash and then the sequential page number of that Appendix. Example: **A-1**

**PARAGRAPH
 HEADINGS**

- Paragraph headings are 12 pt., left flush, bold, beginning with the decimal number, and then a default tab of 1.0"
- Double-space before and after all first-level headings. For subsequent levels, place period after the heading, enter two spaces and begin the paragraph text on the same line.
- When the paragraph text begins on the same line, a period follows the heading. The heading is underlined, but the number is not underlined.

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PUNCTUATION AND MISC.

- Punctuation shall comply with (acceptable/traceable) writing standards.
- Backslashes have no spaces between the backslash and the characters. Example: On/Off
- When a station name is used in conjunction with station or model name, it is considered a proper noun and is capitalized. Example: Instructor Station.
- When a station name is used by itself without station in the name, or its model name, it is considered a common noun and is not capitalized. Example: instructor.

TABLES

- If a Table is in reference to graphics, the Table shall follow the graphics.
- Captions are Arial 12pt. **bold**, title case, centered above the table, and double spaced before the caption and after the caption.
- Text within the table is 10pt.
- Heading titles will clearly explain the contents of the column.
- All Tables shall have headings that will stay with the table if the table is split across pages. If the Table is split across more than one page the Table title shall have "Continued" added after the title.
- Table headings are **bold** and centered.
- Cells have .3 pt space before text.
- Single line spacing between text.
- Double border around table.
- Double border around the headings cells
- Triple space after the table.

Table X-X. Table Format Example

Heading	Heading	Heading
Line 1	Format of column 2, line 1.	Format of column 3, line 1.
Line 2	Format of column 2, line 2.	Format of column 3, line 2.
Line 3	Format of column 2, line 3.	Format of column 3, line 3.

**WARNINGS,
CAUTIONS, AND
NOTES**

Warnings

- Heading is in all caps, bold, unpunctuated, with a 2¼ pt double border.
- Border, see example below. Double space before and after the heading.
- The paragraph text is normal text, not bolded, and justified with a 1” indent on both sides.

Cautions

- Heading is in caps, bold, unpunctuated, with a 2¼ pt single border.
- Border, see example below. Double space before and after the heading.
- The paragraph is normal text, not bolded and justified with a 1” indent on both sides.

Notes

- Heading is in caps, bold, unpunctuated, and underlined. Double space before and after the heading.
- Border, see example below.
- The paragraph text is normal text, not bolded, and justified with a 1” indent both sides.



Warnings are used for anything that may cause personal injury/death.



Cautions are used for anything that may damage equipment, or that may result in a loss of data.

NOTE

Notes point out items of special interest or importance to the reader.

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(Insert Classification of Publication Here)

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